(19) (11) Publication number: **62242805 A**

Generated Document.

PATENT ABSTRACTS OF JAPAN

(21) Application number: **61086041**

(22) Application date: **16.04.86**

(51) Intl. Cl.: **G01B 9/02** G01S 17/06

(30) Priority:

(43) Date of application publication: **23.10.87**

(84) Designated contracting states:

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(54) OPTICAL FIBER DISPLACEMENT SENSOR

(57) Abstract:

PURPOSE: To detect not only the quantity of displacement of a body to be measured, but also the displacing direction by providing two optical fibers and adjusting the position relations with fixed mirrors facing them so that interference light beams propagated in optical fibers have a phase difference.

CONSTITUTION: Laser light incident on an optical fiber 1 for input is split into two by a Y branch optical fiber 2 and then propagated in the optical fibers 10 and 20. Those incident light beams which are branched reach end surfaces respectively, and reference light which is part of a light beam reflected by a half-mirror 12 or 22 is propagated in the optical fiber 10 or 20 in the opposite direction. Light transmitted through the mirror 12 or 22 is collimated by a rod lens 11 or 12 to travel toward a mirror 7, and each reference light beam which is reflected by the mirror returns to the lens 11 or 12 and is converted and incident on the fiber 10 or 20. The length of the optical path from the branch point of the fiber 2 to the mirror 12 or 22 through the fiber 10 or 20 has a slight difference which corresponds to length l, so a phase shift corresponding to length 2l which is twice the length of the reference light, of the fibers 10 and 20 is generated. Therefore, even interference light beams obtained from the output optical waveguides 5 and 6 have a phase difference.